Varicella (chickenpox)

CLINICAL CASE DEFINITION

An illness with acute onset of diffuse (generalized) maculo-papulovesicular rash without other apparent cause.

CASE CLASSIFICATION

- ❑ **Probable**: a case that meets the clinical case definition, is not laboratory confirmed, and is not epidemiologically linked to another probable or confirmed case
- ❑ **Confirmed**: a case that is laboratory confirmed or that meets the clinical case definition and is epidemiologically linked to a confirmed or probable case

Comments:

- ❑ Two probable cases that are epidemiologically linked would be considered confirmed, even in the absence of laboratory confirmation.
- ❑ In vaccinated persons who develop varicella more than 42 days after vaccination (breakthrough disease), the disease is almost always mild with fewer than 50 skin lesions and shorter duration of illness. The rash may also be atypical in appearance (maculopapular with few or no vesicles).
- ❑ Laboratory confirmation of cases of varicella is not routinely recommended; laboratory confirmation is recommended for fatal cases and in other special circumstances.

TRANSMISSION

Person to person via direct contact or droplet or airborne spread of respiratory tract secretions or vesicle fluid of patients; also from vesicle fluid of persons with herpes zoster (shingles). Chickenpox is highly communicable.

INCUBATION PERIOD

14 – 16 days, range 10 – 21 days. See Varicella Timeline, below.

PERIOD OF COMMUNICABILITY

From 1-2 days before onset of rash until all lesions have crusted (for breakthrough cases who may develop lesions that don't crust: until lesions are fading or until no new lesions occur, whichever is later).

REPORTING/INVESTIGATION

Health care providers, schools, day care providers and camps should report cases/suspect cases of varicella to local health department serving the residence of the case.

Local health department role/responsibilities:

- ♦ Contact case/guardian and health care provider.
- ♦ Determine if case meets clinical case definition.
- ♦ If definition met (probable or confirmed cases), or otherwise suspected as a case, investigate using CDC surveillance worksheet and control guidelines below.

- Assist with coordination of specimen collection and coordination if public health lab resources (MDCH, CDC, etc) are used

- Report/ensure reporting of case to the Michigan Disease Surveillance System (MDSS). CDC Varicella Surveillance Worksheet may be helpful in field investigation to collect and capture data. At a minimum, obtain basic demographic information, immunization history (number of doses and dates) from provider record or MI Care Improvement Registry (MCIR - state immunization registry), and an estimate of the number of lesions, which serves as a proxy for disease severity. Number of lesions can be approximated as follows:

    - **Less than 50 lesions** –the lesions can be easily counted within 30 seconds
    - **50-249 lesions** – the person's hand can be placed between the lesions without touching a lesion
    - **250-499 lesions** – the person's hand cannot be placed between the lesions without touching a lesion
    - **More than 500 lesions** – in this case, the lesions are clumped so closely together that it is difficult to see normal skin.

- Update the MDSS record in a timely manner with new or additional info as it becomes available. Finalize MDSS record when case investigation is complete.

- In the event of death, obtain and send copies of hospital discharge summary, death certificate, and autopsy report to MDCH Immunization Division.

- Outbreak reporting: Varicella outbreaks consisting of 5 or more cases in a group activity setting (school, daycare, camp, etc) should be reported to MDCH VPD Surveillance Coordinator at 517-335-8159. Information needed is number of cases, dates of first case onset and last case onset, setting (school, day care, etc), number previously vaccinated (and number of doses, i.e. number with 1 dose, number with 2 doses), number never vaccinated, median age and age range.

LABORATORY CONFIRMATION

Lab confirmation of varicella cases is not routinely recommended but will eventually become standard practice as overall incidence continues to decline. Confirmation is recommended to confirm the diagnosis in severe or unusual cases and for fatal cases. Laboratory confirmation for varicella is defined as:

- Isolation of varicella virus from a clinical specimen, or
- Direct fluorescent antibody (DFA), or
- Polymerase chain reaction (PCR), or
- Significant rise in serum varicella immunoglobulin G (IgG) antibody level by any standard serologic assay

Varicella lab tests are available commercially. Varicella DFA testing is available through MDCH laboratory. See additional information under LABORATORY SPECIMENS: PROCEDURES AND CONSIDERATIONS, (see page 4.)

IMMUNITY/SUSCEPTIBILITY

Individuals should be considered immune (protected against) varicella if they meet one or more of the following conditions:

1. Documentation of age-appropriate vaccination:
    a. Preschool-aged children ≥12 months of age: one (1) dose
    b. School-aged children, adolescents, and adults: two (2) doses[1]
2. Laboratory evidence of immunity[2] or laboratory confirmation of disease
3. Born in the US before 1980[3]
4. A healthcare provider diagnosis of varicella or healthcare provider verification of history of varicella disease[4]
5. History of herpes zoster based on healthcare provider diagnosis.

[1] For children who have received their first dose before age 13 years and the interval between the two doses was at least 28 days, the second dose is considered valid.

[2] Commercial assays can be used to assess disease-induced immunity, but they lack adequate sensitivity to detect reliably vaccine-induced immunity (may yield false negative results).

[3] For healthcare providers and pregnant women, birth before 1980 should not be considered evidence of immunity.

[4] Verification of history or diagnosis of typical disease can be done by any healthcare provider (e.g., school or occupational clinic nurse, nurse practitioner, physician assistant, physician). For people reporting a history of or presenting with atypical and/or mild cases, assessment by a physician or their designee is recommended and one of the following should be sought: a) an epidemiologic link to a typical varicella case or b) evidence of laboratory confirmation, if laboratory testing was performed at the time of acute disease. When such documentation is lacking, people should not be considered as having a valid history of disease, because other diseases may mimic mild atypical varicella.

CONTROL MEASURES

- Exclude cases or suspected cases from group activity settings (e.g. schools, day-care centers, work places, camps) until all lesions have crusted. Instruct cases/suspect cases to avoid exposing other persons.

    Note: Vaccinated persons with varicella (i.e. “breakthrough” cases) may develop lesions that do not crust (that is, macules and papules only, no vesicles). These persons are considered no longer contagious once lesions have faded (skin lesions in the process of resolving), or once no new lesions occur, whichever is later.

- Exposed susceptible persons should be vaccinated as soon as possible; post-exposure vaccination with varicella vaccine given within 3 days of exposure may prevent illness or modify severity of disease (studies indicate 70% - 100% effectiveness). Post-exposure prophylaxis use of vaccine up to 5 days after exposure may also be effective.

- Persons exposed to the case in group-activity settings (e.g. schools, day-care centers, work place, camps) who cannot readily provide documentation of varicella immunity should be vaccinated. In outbreak settings consideration can be given to excluding those refusing vaccination until 21 days after the last identified case.

- If exclusion is implemented, persons may be re-admitted to the activity setting/institution upon vaccination.

- Enhance surveillance in the affected setting and community.

LABORATORY PROCEDURES AND CONSIDERATIONS

Consider laboratory confirmation of varicella cases for severe cases (e.g. involving hospitalization or death). Confirmation of at least one case is also recommended in outbreaks. PCR (polymerase chain reaction) methods are available and the method of choice for rapid clinical diagnosis. Specimens for VZV PCR include swabs of fluid from unroofed vesicles, crusts.

DFA tests are an alternate method of confirmation; these are not as sensitive as PCR. Appropriate specimens for DFA are a scraping or swab from the base of open vesicles. Additional information on varicella testing services available through MDCH is available at:

DFA testing http://www.michigan.gov/documents/LSG_VZV-HSV_DFA_87624_7.doc

Vaccinia/Variola/Pox virus testing http://www.michigan.gov/documents/LSG_VVP_DFA_66597_7.doc

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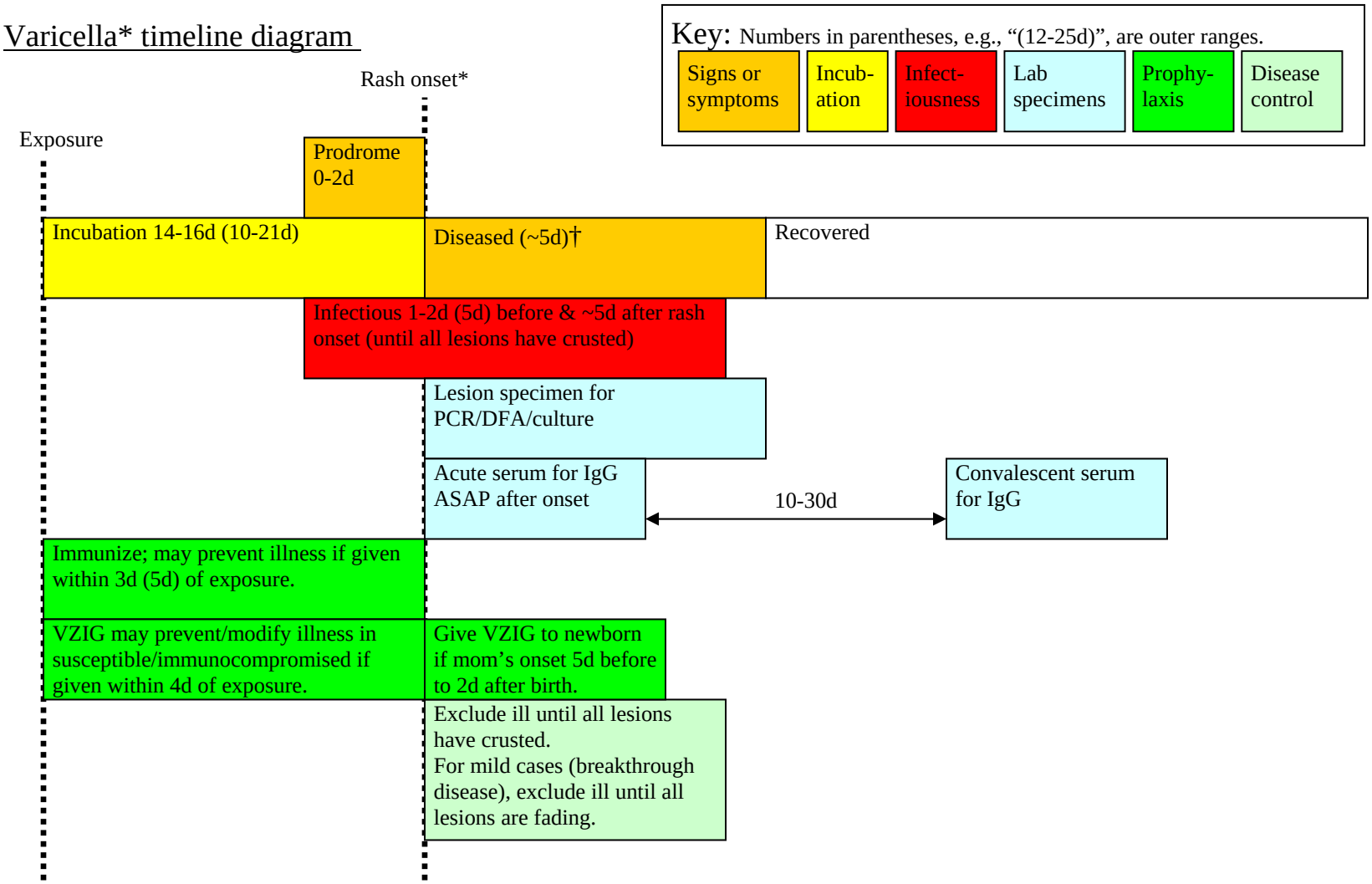
Varicella* timeline diagram



* This diagram applies only to chickenpox. Shingles is also caused by varicella zoster virus, but is much less infectious.
† Cases may be asymptomatic or very mild, especially in vaccinated individuals. Such cases can still transmit disease.

Sources: Control of Communicable Diseases Manual, Red Book, Pink Book, CDC VPD surveillance manual